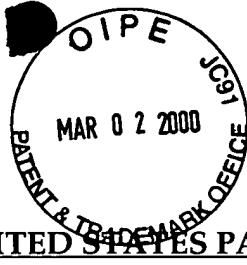


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#12

Attorney's Reference No.: 060850.P002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application for:

Thermos, Michael J.

Serial No. 08/975,284

Filed: November 20, 1997

For: NOZZLE

Examiner: Weldon, R.

Art Group: 3752

APPEAL BRIEFAssistant Commissioner for Patents  
Washington, D.C. 20231RECEIVED  
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Dear Sir:

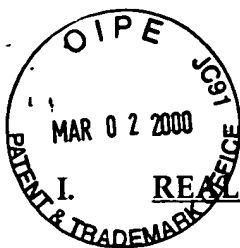
Applicant resubmits, in triplicate, the following Appeal Brief, which incorporates Applicant's additional arguments specifically directed toward those claims and respective grounds for rejection which the Examiner required to be included in his Notice of Defective Brief, mailed on February 2, 2000. The defects being addressed and remedied, Applicant respectfully resubmits the brief for consideration by the Patent Board of Appeals and Interferences. Please charge any additional amount due or credit any overpayment to Deposit Account No. 02-2666.



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**I. REAL PARTY IN INTEREST**

The real party in interest is Nitrous Oxide Systems of Costa Mesa, California.

**II. RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences which will affect or be affected by the outcome of this appeal.

**III. STATUS OF CLAIMS**

Claims 1-13 are pending in the application. All have been rejected by the Examiner.

**IV. STATUS OF AMENDMENTS**

No amendment has been filed subsequent to the final rejection.

**V. SUMMARY OF THE INVENTION**

The invention relates to an apparatus for an injection nozzle utilizing nitrous oxide to form an aerosol with fuel in an internal combustion engine. The apparatus has a body member defining an angular bore and a straight bore which intersect such that the angular bore is in fluid communication with the straight bore. Concentric to the straight bore is a tube communicating with an inlet end of the straight bore and substantially flush with the outlet end of the body member. The tube and body member in combination define an annular channel around the

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tube and a plurality of radially spaced outlet ports distributed around a central outlet port.

In operation within a combustion engine, an oxidizing agent such as nitrous oxide flows under pressure through the tube and out the central port. Fuel streams under pressure through the angular bore and into the straight bore, flowing around the tube and is expelled from the outlet ports radially spaced around the central port. Upon exiting the tube, which is flush with the outlet end and substantially co-planar with the radially distributed outlet ports, the oxidizing agent, for instance nitrous oxide, rapidly expands to shear each of the fuel streams emitted through the radial ports thereby forming an aerosol of nitrous oxide and fuel, aiding combustion. Page 6, lines 4-10.

## VI. ISSUES

The issues involved in this appeal are as follows:

Are Claims 1, 5-8, 12 and 13 unpatentable under 35 U.S.C. § 102(e) as being anticipated by Rodrigues-Ely, U.S. Patent No. 874,666 ("Rodrigues").

Are Claims 1, 4-8 and 10 unpatentable under 35 U.S.C. § 102(e) as anticipated by Yerkins, U.S. Patent No. 3,477,112 ("Yerkins").

Is Claim 2 unpatentable under 35 U.S.C. § 103(a) as rendered obvious by Rodrigues in view of Zwicker, U.S. Patent No. 4,248,384 ("Zwicker").

Are Claims 3 and 9 unpatentable under 35 U.S.C. § 103(a) as rendered obvious by Rodrigues in view of Magner, U.S. Patent No. 3,866,839 ("Magner").



Are Claims 4 and 10 unpatentable under 35 U.S.C. § 103(a) as rendered obvious by Rodrigues in view of Yerkins.

Is Claim 11 unpatentable under 35 U.S.C. § 103(a) as rendered obvious by Rodrigues in view of Pearce, U.S. Patent No. 3,838,820 ("Pearce").

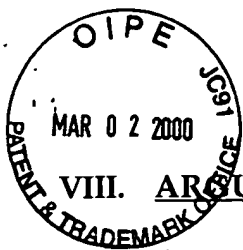
## VII. GROUPING OF CLAIMS

Applicant submits that the claims do not stand or fall together. Accordingly, Applicant groups the claims as follows:

Group I	Claim 1
Group II	Claim 2
Group III	Claim 3
Group IV	Claim 4
Group V	Claim 5 and 6
Group VI	Claims 7 and 8
Group VII	Claim 9
Group VIII	Claim 10
Group IX	Claim 11
Group X	Claim 12
Group XI	Claim 13

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The reason for the independent patentability of the separate groups is discussed in detail below.



## VIII. ARGUMENT

### A. Overview Of The Invention And Prior Art

#### 1. Overview of the Invention

The invention is drawn to an injection nozzle for an internal combustion engine defining a fuel channel and a nitrous oxide tube which communicate only at the nozzle outlet where radially spaced fuel ports surround a nitrous oxide port. Emission of the nitrous oxide gas, under pressure, from the nitrous oxide port shears the fuel emitted from the radially surrounding ports to form an aerosol within a large volume of the combustion chamber, thus causing it to burn more efficiently.

As compared to the prior art of record, the use of Applicant's invention in combination with a combustion engine, as consistently claimed and described by the Applicant, is distinctive over the cited references, all of which are drawn to welding or torch tips. Moreover, the lack of any disclosure of coupling members as claimed by Applicant in the prior art of record further distinguish from the references.

#### 2. Overview of Rodrigues

Rodrigues teaches a torch tip for perforating and cutting metals which is configured to emit a combustible gas for heating a metal, and an oxidizing gas under high pressure for cutting the metal. Absent from Rodrigues is any teaching, suggestion or motivation for use of the invention in a combustion engine, or to create an aerosol to assist in combustion. Instead, combustible gas is already ignited prior to its combination with the oxidizing stream, which directs, rather

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than disperses, the heat energy to the metal surface to be cut. Hence, the preferred embodiment discloses the oxidizing gas released from an opening in a plane lower than the combustible gas outlets, to provide a more directable stream. Structurally, Rodrigues fails to disclose the elements claimed by Applicant. For instance, Rodrigues lacks disclosure of a straight bore and concentric tube disposed therein and lacks disclosure of coupling members engaging the channels.

### 3. Overview of Yerkins

Yerkins is directed to a method of fabricating torch tips formed from two components, an elongated housing and an elongated insert disposed within the housing. As with Rodrigues, no teaching, suggestion or motivation, let alone disclosure, appears in Yerkins relating to any other use for its fabrication method other than for torch tips. Moreover, the coupling method of providing the gases to the Yerkins torch tip illustrates the shortcomings of the Examiner's inherency argument, where Yerkins discloses only one coupling for both gas inlets. Applicant, in contrast claims a first and second coupling.

### 4. Overview of Zwicker

Zwicker is directed to a torch tip which may be fashioned from a number of metal alloys, including stainless steel. Zwicker includes no disclosure, teaching, suggestion or motivation as to use in combination with a combustion engine. As such, Zwicker fails to teach, suggest or motivate use of stainless steel as a component material for Applicant's combustion nozzles.



5. Overview of *Magner*

*Magner* is directed to a torch tip, and features intended to prevent "flash back." *Magner* consequently lacks any disclosure, teaching, suggestion or motivation for use of the tip in combination with a combustion engine. *Magner*, therefore, fails to teach or suggest use of radially spaced outlet ports about a center passage to increase combustibility by creating an aerosol. Moreover, as the outlet ports in *Magner* are part of a tip cover fitted over the body, *Magner* does not render obvious Applicant's claims directed to radially spaced outlet ports defined by the nozzle body.

6. Overview of *Pearce*

*Pearce*, as with the other cited art, also is directed to torch tips. The tips shown in *Pearce* are made from two drawn copper tubes drawn together to form a combined tube. As with *Magner* and *Zwicker*, combining *Pearce* with *Rodrigues* fails to teach or suggest use of the tip disclosed in combination with a combustion engine. Moreover, nothing in *Pearce* discloses spaced outlet ports defined by conjunction of body and flange members.

B. Group I: Rejection Of Claim 1 As Anticipated By *Rodrigues*

It is axiomatic that to anticipate a claim, every element of the claim must be disclosed within a single reference. Thus, if even one feature of Claim 1 is not found in *Rodrigues*, the rejection of Claim 1 under 35 U.S.C. § 102 must be reversed. Moreover, all material claimed features and limitations must be

contained within the four corners of the prior art reference. In re Coker, 175 U.S.P.Q. 26 (CCPA 1972) and In re Outtrup, 189 U.S.P.Q. 345 (CCPA 1976).

Rodrigues fails to disclose any use, modification, or application of its torch tip "in combination with an internal combustion engine." For this reason alone, the rejection of claim 1 should be reversed. Even were Rodrigues to disclose all other elements of the Applicant's claim, which Applicant asserts it does not, this deficiency in Rodrigues precludes anticipation of Claim 1.

As stated by Lipscomb, in *Walker on Patents*, Section 4:16, (1984), "A machine which is not designed by its maker, nor actually used, nor apparently adapted to perform the function of the patented machine, and which is discovered in a remote art and was used under radically different conditions to perform another function, neither anticipates nor limits the patent."

Here, Rodrigues is drawn to torch tips emitting combustible gas in combination with an oxidizing gas that directs a jet at a piece of metal to be cut or welded. Rodrigues discloses no other uses or applications for its invention. Applicant's invention is used in combination with an internal combustion engine to create an aerosol of fuel-nitrous oxide mixture to allow for its efficient combustion in a combustion chamber to run the engine. The Examiner can point to no reference in Rodrigues suggesting its use in a combustion engine, let alone to produce an aerosol fuel mixture.

Clearly, the Examiner cannot find and point to all material claimed features and limitations of Applicant's Claim 1 within the four corners of Rodrigues, as he must to establish anticipation. Furthermore, Rodrigues also fails to disclose every

element of Applicant's claim aside from its use in combination with a combustion engine. For instance, a tube concentric with a straight bore and terminating substantially flush with the outlet end of the body member is absent from Rodrigues.

Referencing the drawings in Rodrigues, specifically figure 1, the Examiner equates channel b in Rodrigues as equivalent to Applicant's concentric tube. The Examiner further references a straight bore in Rodrigues though none is numbered in the drawing or disclosed in the specification. Accepting such characterizations, arguendo, the Examiner must also account for structure identified as c and f in Rodrigues, which points to a mouthpiece through which outlet channels e and d extend. From the drawings of Rodrigues' invention in Figure 1, c and f prevent tube and body member (using Applicant's claim parlance) from terminating substantially flush with the outlet end of the body member. Moreover, mouthpiece c and f define the outlet ports, not the tube and body member, also directly contrary to Applicant's Claim 1.

The Examiner has failed to account for all claimed features and limitations in Claim 1. Therefore, Rodrigues is incapable of anticipating Applicant's claim 1 and the rejection of Claim 1 necessarily fails.

C. Group I: Rejection Of Claim 1 As Anticipated By Yerkins

As with Rodrigues, Yerkins discloses a torch tip with no suggestion or teaching as to its use in combination with a combustion engine. Yerkins discloses a method for producing a torch tip for heating and cutting metals dispensing a

heating jet and a pure oxygen jet. There is simply no disclosure supporting application of the production method in Yerkins to use of the "conventional torch tip" in combination with a combustion engine. As with Rodrigues, Yerkins therefore fails to disclose every element and limitation present in the Applicant's claim. The standard for the rejection is unmet. Therefore, the rejection of Claim 1 based on Yerkins fails.

D. Group II: Rejection Of Claim 2 As Rendered Obvious By Rodrigues In View Of Zwicker

As the Examiner has failed to establish a *prima facie* case of obviousness in view of the references of record, the Federal Circuit Court of Appeals In re Rijckaert, 9 F.3d 1531, 28 U.S.P.Q.2d 1955 (Fed. Cir. 1993) held that:

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a *prima facie* case of obviousness. . . "A *prima facie* case of obviousness is established when the teaching from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." . . . If the examiner fails to establish a *prima facie* case, the rejection is improper and will be overturned. (Emphasis added.)

9 F.3d at 1532, 28 U.S.P.Q.2d at 1956.

As established previously with respect to Claim 1, Rodrigues fails to teach or suggest use in combination with a combustion engine. Zwicker fails to remedy such deficiency. Instead, the Examiner points to a brief disclosure in Zwicker that torch tips, according to its invention, may be formed of "corrosion resistant metallic alloy, such as copper alloy, stainless steel and the like." Column 3, line 61-63.

Further reference to Zwicker illustrates further its inapplicability to provide any teaching or suggestion of Applicant's invention: "In accordance with this

invention there is provided a torch, such as a cutting torch, that obviates the tendency to have flashback and sustained burning with certain fuels, such as acetylene, yet still achieve the flexibility theoretically inherent in injector type mixer torches." Column 2, lines 20-25. At most, Zwicker discloses that portions of a torch tip may be fashioned of stainless steel, while other elements of the torch are made of other metals such as copper. See Column 4, lines 43-56. Zwicker, as with Rodrigues, is silent as to Applicant's particular uses. Thus, having failed to provide a prima facie case of obviousness, the rejection of claim 2 is erroneous.

E. Group III: Rejection Of Claim 3 As Rendered Obvious By Rodrigues In View Of Wagner

As previously addressed, Rodrigues fails to anticipate Applicant's claim 1, from which claim 3 depends. Moreover, Magner fails to disclose "radially spaced outlet ports and a center bore of a size to receive and engage the tube such that fluid communication through the center bore around the tube is prevented." No mention of a center bore or of any structure used to prevent fluid communication between the radial outlets and the center outlet is made in Magner. This may be because such fluid communication, detrimental to the creation of an aerosol fuel-gas spray in a combustion engine is less of a problem for a torch tip design. In contrast to the Examiner's asserted objective in Magner to prevent such communication, specifically, at the outlet openings, which Applicant despite careful review fails to find, Magner discloses interior valves and sleeves far removed from the outlet openings which prevent communication between gases prior to their expulsion through the outlets.

For instance, Magner discloses valve members in the interior of the torch, 78 and 88, well back from the radially spaced openings, 120 and 122, which permit passage of gas and oxygen to the openings for discharge to the atmosphere. These valve members engage to automatically close in a flash back condition. Column 5, lines 35-45. The absence of any apparent concern with fluid communication at the outlet openings in Magner, as opposed to preventing fluid communication within the apparatus body, if anything, teach away from Applicant's claim 3.

F. Group IV: Rejection Of Claim 4 As Anticipated By Yerkins

As previously addressed, Yerkins fails to anticipate Applicant's Claim 1, from which Claim 4 depends. Moreover, Yerkins simply fails to disclose a flange member causing annular disbursement of fuel around the central port. By reference to the drawings of Yerkins, gas outlet openings are specific to "a plurality of gas outlet passageways 48" which extend through hub 44. Column 3, lines 23-26. Thus, the outlets are not the result of a single flanged opening as Applicant claims. The passageways, furthermore, are separately intended to be rapidly drilled to form the torch tip. By failing to disclose the flange member claimed, among other reasons previously addressed, Yerkins fails to disclose all elements and limitations of Applicant's claim. Yerkins does not anticipate Applicant's Claim 4.

G. Group IV: Rejection Of Claim 4 As Rendered Obvious By Rodrigues In View Of Yerkins

As previously addressed, Yerkins fails to disclose a flange member defining outlet ports. Therefore, the lack of a flange member in Rodrigues, which the

Examiner admits, is not rectified by Yerkins. The references cited fail to support use of a flange member as Applicant claims. On this basis alone, Yerkins in combination with Rodrigues fail to render Applicant's claim obvious.

H. Group V: Rejection Of Claims 5 And 6 As Anticipated By Rodrigues

Applicant incorporates its arguments as to the failure of Rodrigues to anticipate claim 1 from which claims 5 and 6 ultimately depend. Applicant further points out that Rodrigues fails to disclose coupling members engaging inlet ends of the channels. The Examiner argues that, by inherency, such coupling members are necessary to the operation of Rodrigues.

To rely on inherency the Examiner is not permitted to engage in conjecture or supposition, the allegedly inherent feature must be essential such that the disclosed device *could not exist without it*. In re Robertson, Fed. Cir. No. 98-1270, Feb. 25, 1999.

No inherency argument supports use of a second coupling member engaging the straight bore and coupled to the tube. Channel b in Rodrigues could easily be coupled to an oxygen source without engaging the bore (un-numbered and undisclosed in Rodrigues, as addressed by Applicant previously). Clearly, Rodrigues could exist and operate without the structure claimed by Applicant. Thus, the reliance on inherency is misplaced and does not anticipate Applicant's claims. Moreover, the Examiner's reliance on inherency is unsupported by extrinsic evidence and is therefore founded solely on his conjecture and supposition, which the Federal Circuit specifically found improper as a basis for anticipation in In re Robertson. The rejection, and its conjectural basis, are therefore erroneous.

I. Group V: Rejection Of Claims 5 And 6 As Anticipated By Yerkins

Applicant incorporates its prior arguments with respect to the failure of Yerkins to anticipate Claim 1, from which claims 5 and 6 ultimately depend. Applicant further points out that Yerkins, by its disclosure and drawings, fails to support the Examiner's inherency arguments as to first and second coupling members. In addition to the improper basis in speculation and conjecture, Yerkins clearly demonstrates use of a single coupling conduit 54 to engage both central gas inlet opening 18 and peripheral gas inlet openings 16.

Demonstrably, the use of a first and second coupling member is not an inherent feature of Yerkins. The Examiner, therefore, has no basis for presuming such structure is necessary to the operation of Yerkins and hence cannot legally rely on the doctrine of inherency to read into Yerkins what is not there and which is claimed by the Applicant. Therefore, the rejection of claims 5 and 6 is erroneous.

J. Group VI: Rejection Of Claims 7 And 8 As Anticipated By Rodrigues

As previously addressed, the Examiner may not rely on inherency to account for structure not present in the cited reference. As it relates to the coupling members recited in Claim 7, these are not present in Rodrigues, as demonstrated, and the Examiner has no basis for reading these into the reference by application of supposition and conjecture. Rodrigues utterly fails to disclose a coupling member engaging a central bore and coupled to straight channel b and need not include such



member to operate. Thus, the rejection of claim 7 fails as well. Claim 8, being dependant upon Claim 7, is therefore also not anticipated by Rodrigues.

K. Group VI: Rejection Of Claims 7 And 8 As Anticipated By Yerkins

Applicant previously demonstrated that the Examiner cannot rely on inherency to account for the coupling members which are clearly absent from both Rodrigues and Yerkins. Applicant has also previously shown that the two separate gas channels disclosed in Yerkins are coupled to a gas source by one coupling member. Inherency cannot account for Applicant's claimed structure which is absent from Yerkins. Claim 8, by its dependence on claim 7, is therefore not anticipated by Yerkins. The rejection should therefore be overturned.

L. Group VII: Rejection Of Claim 9 As Rendered Obvious By Rodrigues In View Of Magner

Applicant previously demonstrated that independent claim 7, upon which claim 9 is based, is not anticipated by Rodrigues. Moreover, Magner fails to disclose outlet ports defined by a body member. Reference to the drawings in Magner demonstrate, the outlet portions 122 contained within a sleeve 16 mounted over a tip 40. Nowhere does there appear any disclosure about a body member, or any structure equated by the Examiner with a body member, defining the outlet ports. Far from rendering Applicant's claim obvious, Magner teaches away from it by disclosing use of a detachable tip containing the outlet ports.

Additionally, Magner also discloses a torch tip, and provides no suggestion of use with a combustion engine. Magner not only fails to disclose ports defined by a

body member, thus failing to address this deficiency in Rodrigues, Magner also fails to remedy Rodrigues' lack of disclosure or suggestion related to any use other than as a cutting torch. Therefore, the prima facie case of obviousness is absent again.

M. Group VIII: Rejection Of Claim 10 As Anticipated By Yerkins

Applicant has previously demonstrated that Yerkins fails to disclose a flange member defining outlet ports (See Sections F and G, infra). Therefore, Yerkins fails to disclose all elements and limitations of Applicant's claim 10 which recites outlet ports defined by a flange member. Yerkins does not anticipate Applicant's Claim 10.

N. Group VIII: Rejection Of Claim 10 As Rendered Obvious By Rodrigues In View Of Yerkins

As set forth previously, Yerkins lacks a flange member, but instead relies upon a plurality of gas outlet passageways individually drilled through hub 44 which are self-defined structures and not flanged openings. Of course, Rodrigues entirely lacks a flange member, disclosing separate outlet ports, let alone a flange member which defines annularly spaced outlet ports. The references cited fail to support use of a flange member as Applicant claims. The Examiner's characterization that use of a flanged member as claimed by Applicant is within the ordinary skill of one in the art is speculation, unsupported by extrinsic evidence or the references cited. There is no prima facie showing of obviousness. The rejection fails.

O. Group IX: Rejection Of Claim 11 As Rendered Obvious By Rodrigues In View Of Pearce

Once again, Applicant reiterates and incorporates its arguments with respect to Rodrigues, which fails to disclose, by inherency or otherwise, the recited elements of Claim 7, upon which Claim 11 is based. Moreover, Rodrigues, with its multi-portal outlets, is incompatible with the torch tip described in Pearce. No motivation, teaching or suggestion is demonstrated by the Examiner showing how these references would be successfully combined to render the instant claim obvious. Without such, the combination is ad hoc and only with hindsight, thus failing to establish the requisite prima facie case to support the rejection.

P. Group X: Rejection Of Claim 12 As Anticipated By Rodrigues

For the reasons set forth in Applicant's arguments with respect to Claim 1, this claim is not anticipated by Rodrigues, which fails to disclose the elements and limitations of Applicant's claim 1. Claim 12, being dependant upon claim 1, and incorporating all of its elements and limitations, cannot be anticipated by Rodrigues. Moreover, the reference or disclosure to a straight bore in Rodrigues is lacking, given the Examiner relies solely on cross-hatching on a drawing with no corresponding explanatory language within the reference itself. For these reasons, the rejection is improper.

Q. Group X: Rejection Of Claim 12 As Anticipated By Yerkins

Never during prosecution of the application did the Examiner specifically address the manner in which Yerkins anticipates Applicant's Claim 12.

Applicant's claim recited a predetermined angle of intersection between the straight and angular bores of greater than five degrees. Reference to Yerkins shows what the Examiner designates as the angular bore 32 intersecting that element regarded by the Examiner as the straight bore 34 at an almost parallel position to the horizontal axis defined by the straight bore. The sectional telescoped configuration of bore 34 forms a concentric ring (unnumbered in Yerkins) which provides point of intersection with inlet passageways 32. The substantially parallel intersection of element 32 with element 34 in Yerkins allows the back end 12 of the Yerkins torch tip 10 to be connected to the gas sources by an internally threaded cap 52 which fits over the back end of the torch tip in communication with both element 32 and element 34.

It is clear from the drawing in Yerkins that the invention fails to disclose an angle of intersection over five degrees, as Claimed by the Applicant. Moreover, the configuration pictured in Yerkins functions to allow for connection of the torch tip to the gas sources using one threaded cap. The Examiner has not pointed out where in Yerkins is disclosed the elements of Applicant's Claim 12. Without such disclosure in Yerkins, it cannot, ipso facto, anticipate Applicant's Claim. Moreover, as Applicant has previously demonstrated, Yerkins fails to anticipate Claim 1, from which Claim 12 depends.

R.     Group XI: Rejection Of Claim 13 As Anticipated By Rodrigues

Applicant's arguments with respect to the failure of Rodrigues to anticipate Claim 1 are incorporated again here. Moreover, the specific limitation "a threaded region for engaging a manifold port of the internal combustion engine"

necessarily fails to have anticipatory support within Rodrigues which discloses a torch tip. The specific limitation recited in this claim being absent, Rodrigues simply cannot anticipate it. The rejection fails.



IX. CONCLUSION AND RELIEF

Based on the foregoing, Applicant requests that the Board overturn the rejection of the indicated claims and hold that these claims are allowable.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR, & ZAFMAN LLP

Dated: March 1, 2000

By: \_\_\_\_\_

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\_\_\_\_\_  
Laura Harmon

\_\_\_\_\_  
March 1, 2000



## X. APPENDIX

The claims involved in this Appeal are as follows:

1           1.     A nozzle for providing a nitrous oxide/fuel mixture to a combustion  
2 cylinder comprising;  
3           a body member used in combination with a combustion engine having an  
4 inlet end and an outlet end, the body member defining an angular bore and a  
5 straight bore, the angular bore intersecting the straight bore and terminating at an  
6 inlet end such that fluid communication exists between the inlet end of the angular  
7 bore and the straight bore;  
8           a tube concentric with the straight bore and terminating substantially flush  
9 with the outlet end of the body member and in fluid communication with an inlet  
10 end of the straight bore wherein the tube and body member in combination define  
11 an annular channel around the tube and a plurality of radially spaced outlet ports  
12 distributed around a central outlet port.

1           2.     The nozzle of claim 1 wherein the body member is stainless steel.

1           3.     The nozzle of claim 1 wherein the outlet end of the body member  
2 defines the radially spaced outlet ports and a center bore of a size to receive and  
3 engage the tube such that fluid communication through the center bore around the  
4 tube is prevented.

1           4.     The nozzle of claim 1 wherein the body member defines a single hole  
2 in the outlet end, the nozzle further comprising:

3 a flange member coupled to the tube and concentric with the tube the flange  
4 member engaging a portion of the body defining the single hole, the flange member  
5 for causing annular disbursement of fuel around the central outlet port.

1 5. The nozzle of claim 1 further comprising:  
2 a first coupling member engaging the inlet end of the angular bore and  
3 defining a fuel inlet port; and  
4 a second coupling member engaging the inlet end of the straight bore and  
5 defining an oxidizing agent inlet port, the second coupling member coupled to the  
6 tube.

1 6. The nozzle of claim 5 wherein a flow path of an oxidizing agent within  
2 the nozzle is linear.

1 7. A nozzle comprising:  
2 a body member defining an angular bore and a straight bore;  
3 a first coupling member engaging an inlet end of the angular bore;  
4 a second coupling member engaging an inlet end of the straight bore;  
5 a tube coupled to the second coupling member and substantially concentric  
6 with straight bore wherein the nozzle defines a plurality of radially spaced outlet  
7 ports around a central outlet port.

1 8. The nozzle of claim 7 wherein the central outlet port and the plurality  
2 of radially spaced outlet ports are substantially coplanar.



1           9.     The nozzle of claim 7 wherein the plurality of annularly spaced outlet  
2 ports are defined by the body member.

1           10.    The nozzle of claim 7 wherein the plurality of annularly spaced outlet  
2 ports are defined by a flange member.

1           11.    The nozzle of claim 7 wherein the plurality of annularly spaced outlet  
2 ports are defined by a conjunction of the body member and a flange member.

1           12.    The nozzle of Claim 1 wherein the angular bore intersects the straight  
2 bore at a predetermined angle greater than five degrees from the horizontal defined  
3 by the longitudinal axis of the straight bore.

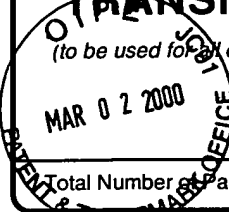
1           13.    The nozzle of Claim 1 wherein the body member comprises a threaded  
2 region for engaging a manifold port of the internal combustion engine.



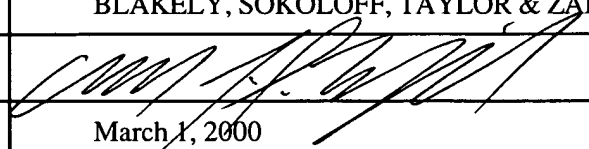
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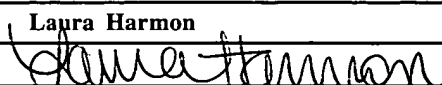
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	<b>Filing Date</b>	November 20, 1997	
	<b>First Named Inventor</b>	Michael J. Thermos	
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	<b>Examiner Name</b>	Kevin Weldon	
<b>Total Number of Pages in This Submission</b>	82	<b>Attorney Docket Number</b>	060850.P002

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<b>Firm or Individual name</b>	Charles T.J. Weigell, Reg. No. 43,398 BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN
<b>Signature</b>	
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